

REMARKS

Status of Claims:

New claims 26-29 are added. Thus, claims 1-29 are present for examination.

Claim Rejection Under 35 U.S.C. 112:

Claims 24 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claims 24 and 25, as amended, the rejection is respectfully traversed.

The Examiner stated that there is no indication in the claims or the specification as to the meaning of “vias”, and that “vias” is not found in the dictionary.

Claims 24 and 25 have been amended, and the word “vias” in claims 24 and 25 has been changed to “conductive openings”. Thus, claims 24 and 25, as amended, are now believed to be in compliance with the requirements of 35 U.S.C. 112, second paragraph.

Claim Rejections Under 35 U.S.C. 102:

Claims 1-4, 6, 7, 11-15, 17, 18, 22, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al. (U.S. Patent Number 5,919,532) (hereinafter Sato).

It appears that the Examiner has further rejected claims 24 and 25 under 35 U.S.C. 102(b) as being anticipated by Sato. On pages 4 and 5 of the present office action, the Examiner refers to claims 24 and 25. Thus, applicant assumes that claims 24 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato.

With respect to claims 1-4, 6, 7, 11-15, 17, 18, 22, 23, 24, and 25, the rejections are respectfully traversed.

Independent claim 1 recites a method of fabricating an integrated color filter for a liquid crystal display (LCD), comprising:

“providing a substrate;

forming respective gate lines and signal lines on the substrate, wherein the plurality of gate lines and signal lines define respective pixel areas;

forming a plurality of switching elements electrically connected to the signal lines and gate lines for the pixel areas;

forming a protruding pattern on the gate lines, the signal lines, and the switching elements to define respective color filter unit areas;

applying colored resin to form respective color filter units in the color filter unit areas defined by the protruding pattern, the respective color filter units having respective top surfaces with edge portions that are **substantially planar** with respective edge portions of a top surface of the protruding pattern; and

forming respective pixel electrodes **on the respective top surfaces** of the respective color filter units and **on the respective edge portions of the top surface** of the protruding pattern.” (Emphasis Added).

A method of fabricating an integrated color filter for a liquid crystal display including the above-quoted features has at least the advantage that a protruding pattern is formed on gate lines, signal lines, and switching elements to define respective color filter unit areas. Also, colored resin is applied to form respective color filter units in the color filter unit areas defined by the protruding pattern, and the respective color filter units have respective top surfaces with edge portions that are **substantially planar** with respective edge portions of a top surface of the protruding pattern. By forming respective color filter units having top surfaces with edge portions that are **substantially planar** with respective edge portions of a top surface of the protruding pattern, an **amount of material** required for respective pixel electrodes that are formed **on** the color filter units and **on** the protruding pattern can be **reduced**, because the pixel electrodes can be formed directly across the **substantially planar** surfaces, and additional material for the pixel electrodes is not needed to **fill in a spacing** between the top surfaces of the

color filter units and a top surface of the protruding pattern. (Specification; paragraphs [0013] and [0029]; FIG. 4, references 21', 32, and 33).

In the "Response to Arguments" section of the present office action, the Examiner submits that, "the respective color filter units of Sato et al. have respective top surfaces with edge portion that are *substantially* planar with respective edge portions of a top surface of the protruding pattern (Fig. 8, ref. 13); and respective pixel electrodes on the respective top surface of the respective color filter units an[d] on the respective edge portions of the top surface of the protruding pattern (Fig. 8, ref. 13, 11)." (Emphasis Added).

However, Sato neither discloses nor suggests a method of fabricating an integrated color filter for a liquid crystal display in which: (i) colored resin is applied to form respective color filter units in color filter unit areas defined by a protruding pattern, where the respective color filter units have respective top surfaces with edge portions that are substantially planar with respective edge portions of a top surface of the protruding pattern, and (ii) respective pixel electrodes are formed on the respective top surfaces of the respective color filter units and on the respective edge portions of the top surface of the protruding pattern.

The Examiner points to Sato (Fig. 8, ref. 13, 11) as disclosing, "respective pixel electrodes on the respective top surface of the respective color filter units an[d] on the respective edge portions of the top surface of the protruding pattern". (Emphasis Added) However, in the embodiment of the active matrix substrate of **Fig. 8** of Sato, the pixel electrode 12 is beneath both the color pixel portion 13 and a portion of the organic resin protection film 11. (Sato; FIG. 8; column 26, lines 52-64). As a consequence, in the active matrix substrate of Fig. 8 of Sato, the pixel electrode 12 is not formed on a top surface of the color pixel portion 13 and is not formed on an edge portion of a top surface of the organic resin protection film 11. (Sato; FIG. 8, references 11, 12, 13).

While the embodiment of the active matrix substrate of **Fig. 4** of Sato does have a pixel electrode 12 formed on a top surface of a color pixel portion 13 and on an edge portion of a top

surface of organic resin protection film 11, an edge portion of the top surface of the color pixel portion 13 in the embodiment of Fig. 4 of Sato is not substantially planar with the edge portion of the top surface of the organic resin protection film 11. (Sato; FIG. 4; column 24, lines 29-39). Indeed, in the embodiment of Fig. 4 of Sato, the edge portion of the top surface of the color pixel portion 13 is at approximately one-half of the height of the organic resin protection film 11. (Sato; FIG. 4). Also, in the embodiment of Fig. 4 of Sato, the edge portion of the top surface of the color pixel portion 13 is not flat like the top surface of the organic resin protection film 11, but rather is bowed, so it is not substantially planar with the edge portion of the top surface of the organic resin protection film 11. (Sato; FIG. 4). As a result, in the embodiment of Fig. 4 of Sato, additional material for the pixel electrode 12 must be applied to fill in a gap between the edge portions of the top surface of the color pixel portion 13 and the respective edge portions of the top surface of the organic resin protection film 11. (Sato; FIG. 4).

Thus, none of the embodiments of the active matrix substrate in Sato are fabricated in a way in which both: (i) colored resin is applied to form respective color filter units in color filter unit areas defined by a protruding pattern, where the respective color filter units have respective top surfaces with edge portions that are substantially planar with respective edge portions of a top surface of the protruding pattern; and (ii) respective pixel electrodes are formed on the respective top surfaces of the respective color filter units and on the respective edge portions of the top surface of the protruding pattern. (Sato; FIGs. 3, 4, 5I, and 8; references 11, 12, and 13).

Moreover, even in the embodiment of the active matrix substrate in Fig. 8 of Sato where the pixel electrode 12 is beneath the color pixel portion 13, the color pixel portion 13 does not have a top surface with edge portions that are substantially planar with respective edge portions of a top surface of the organic resin protection film 11. (Sato; FIG. 8). Instead, as illustrated in Fig. 8 of Sato, the edge portions of the top surface of the color pixel portion 13 are lower than the respective edge portions of the top surface of the organic resin protection film 11, and the edge portions of the top surface of the color pixel portion 13 are bowed, while the respective edge portions of the top surface of the organic resin protection film 11 are flat. (Sato; FIG. 8).

Therefore, independent claim 1, as amended, is neither disclosed nor suggested by the Sato reference and, hence, is believed to be allowable.

Because they depend from claim 1, dependent claims 2-4, 6, 7, 11, and 24 are believed to be allowable for at least the same reasons that claim 1 is believed to be allowable.

In addition, dependent claim 24, as amended, recites the further distinctions:

“wherein the step of forming a plurality of switching elements electrically connected to the signal lines and gate lines for the pixel areas, comprises:

forming a plurality of gate electrodes connected to the gate lines;

forming a **first insulating layer** on the plurality of gate electrodes;

forming a plurality of source electrodes and a plurality of drain electrodes on the first insulating layer, the plurality of source electrodes being connected to the signal lines; and

forming a **second insulating layer on** the plurality of source electrodes and the plurality of drain electrodes, the second insulating layer formed with respective **conductive openings** passing through the second insulating layer over respective drain electrodes of the plurality of drain electrodes; and

wherein the step of forming a protruding pattern on the gate lines, the signal lines, and the switching elements to define respective color filter unit areas, comprises:

forming a protruding pattern on the gate lines, the signal lines, and the switching elements to define respective color filter unit areas; the protruding pattern formed with respective contact holes aligned with corresponding conductive openings in the **second insulating layer**.” (Emphasis Added).

Sato neither discloses nor suggests a method of fabricating an integrated color filter for a liquid crystal display including the above-quoted features with: (i) a **second insulating layer** being formed **on** a plurality of source electrodes and a plurality of drain electrodes, where the second insulating layer is formed with respective **conductive openings** passing through the second insulating layer **over** respective drain electrodes of the plurality of drain electrodes; and

(ii) a **protruding pattern** being formed with respective **contact holes aligned with** corresponding **conductive openings** in the **second insulating layer**.

Indeed, in the embodiments of the active matrix substrate in Sato, there is **no second insulating layer** formed **on** a plurality of **source electrodes** and a plurality of **drain electrodes**. (Sato; FIG. 7). For example, in the embodiment of the active matrix substrate in Fig. 2 of Sato, the organic resin protection film 11 is formed directly on the drain electrode 9b, and there is **no** second insulating layer formed **on** the drain electrode 9b. (Sato; FIG. 2).

Therefore, dependent claim 24 is neither disclosed nor suggested by the Sato reference for at least that additional reason and, hence, is believed to be allowable.

Independent claim 12 recites an integrated color filter for a liquid crystal display (LCD) with features similar to features of a method of fabricating an integrated color filter for a liquid crystal display of independent claim 1. Therefore, independent claim 12 is believed to be allowable for at least the same reasons that independent claim 1 is believed to be allowable.

Because they depend from claim 12, dependent claims 13-15, 17, 18, 22, 23, and 25 are believed to be allowable for at least the same reasons that claim 12 is believed to be allowable.

Dependent claim 25 recites an integrated color filter for a liquid crystal display with features similar to features of a method of fabricating an integrated color filter for a liquid crystal display of dependent claim 24 and, hence, is believed to be allowable for at least the same additional reasons that dependent claim 24 is believed to be allowable.

Claim Rejections Under 35 U.S.C. 103:

Claims 8, 9, 10, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato.

Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato in view of Takizawa et al. (U.S. Patent Number 6,573,964 B1) (hereinafter Takizawa).

With respect to claims 5, 8-10, 16, and 19-21, the rejections are respectfully traversed.

Dependent claims 8-10 depend from independent claim 1. As discussed above, Sato neither discloses nor suggests a method of fabricating an integrated color filter for a liquid crystal display as recited in independent claim 1. Therefore, dependent claims 8-10 are believed to be allowable for at least the same reasons that independent claim 1 is believed to be allowable. The Patent Office has not made out a *prima facie* case of obviousness under 35 U.S.C. 103.

Dependent claims 19-21 depend from independent claim 12. As discussed above, Sato neither discloses nor suggests an integrated color filter for a liquid crystal display as recited in independent claim 12. Therefore, dependent claims 19-21 are believed to be allowable for at least the same reasons that independent claim 12 is believed to be allowable. The Patent Office has not made out a *prima facie* case of obviousness under 35 U.S.C. 103.

Dependent claim 5 depends from independent claim 1. The Takizawa reference does not cure the deficiency with respect to the teaching of Sato as discussed above with respect to independent claim 1. Therefore, dependent claim 5 is believed to be allowable for at least the same reasons that independent claim 1 is believed to be allowable. The Patent Office has not made out a *prima facie* case of obviousness under 35 U.S.C. 103.

Dependent claim 16 depends from independent claim 12. The Takizawa reference does not cure the deficiency with respect to the teaching of Sato as discussed above with respect to independent claim 12. Therefore, dependent claim 16 is believed to be allowable for at least the same reasons that independent claim 12 is believed to be allowable. The Patent Office has not made out a *prima facie* case of obviousness under 35 U.S.C. 103.

Conclusion:

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 50-0872. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 50-0872.

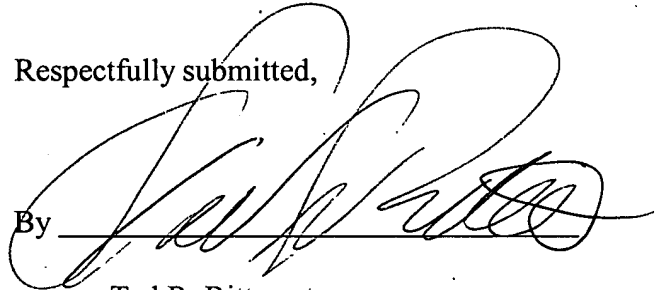
If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 50-0872.

Respectfully submitted,

Date

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